

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BP-93

Applicant : Hugo Lenhard-Backhaus
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Filed : January 29, 2004
For : HEADPHONE
Examiner : Dionne Harvey
Art Unit : 2643

Commissioner for Patents
P.O. Box 1450
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INFORMATION DISCLOSURE STATEMENT

S I R:

The attention of the Examiner and of the Patent and Trademark Office is hereby directed to the references cited in the International Search Report, a copy of which is attached.

EP 0 994 636 A (Sony), corresponding to US 6,385,325 B
(Nageno , et al.):

This publication pertains to headphones with a headband, which is provided with a joint in the middle so that it can be folded together. Additional folding axes are provided in the areas where the headband is connected to the earpieces, so that the earpieces can be folded inward until they rest against the inside surface of the headband. After the headband is folded, the storage volume of



the headphones is thus reduced and the smallest possible configuration is achieved.

The axes of the two earpieces are essentially aligned with each other and are at right angles to the axis of the headband, so that, during the first pivoting movement, the earpieces are rotated out of the main plane of the headphones, and after they have been rotated nearly 180° , they come to rest again essentially in this same plane.

DE 25 40 839 A (Nippon), no English-language publication available:

This publication discloses a headphone headband with elasticity, to the ends of which the earpieces are attached in different ways as indicated in the variants of the disclosure. In the case of the variant according to Figures 2 and 3, a spherical suspension is described, which is formed by a shell-like spherical contact surface, the center point of which is approximately in the center of the earpiece and which also lies in the center of the thickness of the cushion of the earpiece.

According to another design, a connecting rod with weakened cross-sectional areas is provided between the headband and the earpiece, so that, depending on the geometry of the wearer's head, the connecting rod can be bent in the areas where the weakened sections are located, as a result of which the headphones can

conform to the shape of the head. This is elaborated later (Figures 15, 16), where an interesting universal suspension (Figures 18, 19) is also disclosed, in which the center point of the universal joint is between the headband and the earpiece.

A variant with a "slimmer" connecting element can be seen in Figures 20 and 21. Here the head of a mushroom-shaped connecting pin, the base of which is permanently connected to the headband, is introduced into an undercut recess in the headband and thus forms a kind of spherical joint. The center point of this joint is again between the headband of the headphones and the earpiece.

Finally, Figure 27 shows a kind of universal suspension, in which one of the axes is permanently connected to the end of the headband, whereas the other axis, at a right angle to the first, passes through the outer area of the earpiece. The point of intersection of the two axes is in the outer area of the earpiece.

Figure 26, which, like Figure 27, shows headphones already belonging to the state of the art at the time of the present application, discloses that a clamping part is movably attached to the relatively stiff terminal section of the headband, and that an appropriate X-shaped slot is provided in the clamping part for the headband, so that the clamping part can be tilted around the angle formed by the two flanks of the "X".

DE 26 42 786 A (Sennheiser), no English-language publication available:

The headphones which are disclosed in this publication correspond kinematically to those of Figure 27 in DE 25 40 839 A. It comprises a universal suspension, one of the axes of which is a permanent part of the end of the headband, whereas the other axis is at a right angle to the first and passes through the earpiece. In the embodiment according to DE 26 42 786 A the universal suspension is only a one-sided design, being formed by a strap, which passes around approximately 90° of the earpiece and thus allows the earpiece to spring outward into positions which are not parallel to either of the two axes.

JP 10[1998]-174, 187 A (Sawada), no English-language publication available:

This publication discloses headphone kinematics in which the lengths of the ends of the headband are adjustable (telescoping). At each end of the headband, there is a folding axis normal to the plane of the headband, around which a bracket for the earpiece can be pivoted. This bracket has a stub axis, which lies in the plane of the headband and at the end of which a U-shaped retaining strap for a universal suspension of the earpiece is attached. The point of intersection of the two axes of the universal suspension is in the outer area of the earpiece, as also in the case of the universal suspensions of the previously discussed publications.

DE 32 25 812 A (Nippon), corresponding to US 4,463,223
(Yamanoi, et al.)

This publication describes headphones with a headband which is designed to be folded at a point a certain distance away from the earpieces and which for this purpose is provided on each side with an axis normal to the plane of the headphones. When the part closer to the earpiece is rotated into a position representing an extension of the headband, the earpiece arrives in the intended position suitable for listening. In this position, they can also be rotated around an axis which is essentially parallel to the terminal section of the headband, so that the plane of the earpiece is normal to the plane of the headband. In the other end position, these sections lie on top of each other and form a bottom closure, as it were, of the headband. The earpieces can then be rotated 90° around the second axis into the plane of the headband, as a result of which a very space-saving configuration is obtained.

In comparison to this, the invention provides a V-joint, so that each earpiece of the headphone is articulated to the headband by at least two rotational axes, the two rotational axes intersecting each other on or near the point where the central axis of the earpiece passes through the contact surface of the earpiece.

US 5,117,464 A (Jones):

This publication, cited by the USPTO, pertains to a so-called headphone system, because it is provided here that the earpieces can be removed from the headband and attached instead to a baseball

cap, to a sweatband, etc. The detachable connection between the headband and the earpieces is accomplished by a type sawtooth connection, which, even though it is not described, is indicated in Figure 1. The two components can be fixed in various positions by engaging the two parts of the sawtooth connection at different levels.

The earpiece-side part of the sawtooth connection carries a spherical joint, around the center of which an outer part can move. Brackets, which can move longitudinally (parallel to the end part of the headband) are attached to this outer part. The earpiece is screwed to the end of the bracket facing the earpiece. In spite of the questionable disclosure in Figure 7, it is thus established that no relative movement can occur between the longitudinally movable bracket 28 and the earpiece 30. As can be seen from the drawing, the design of the spherical joint is completely "standard", which means that the major portion of the inner part is in fact designed with a spherical surface, and that the outer part surrounds this spherical surface to a point beyond the equator. As a result, the center of the sphere is located above and slightly farther away from the head than the earpiece, as can be clearly seen in Figure 7.

The Invention in light of this State of the Art:

Ball Joint Versus Separate Axes

Some of the prior art pertains to ball joints, whereas the invention proceeds on the basis of separate joint axes with purely rotational mobility. It is therefore necessary first of all to clarify the identity or non-identity between ball joints and combinations of separate rotational axes.

The moveable part of a ball joint is fixed with respect to a point in the center of the ball. Whether a connection to the center of the ball actually exists is irrelevant here, and also irrelevant is whether the two parts of the ball joint are connected to each other around only a portion of a spherical surface. As a result of this fixation around a point in space, three of the six degrees of freedom which each solid (more accurately, rigid) body has are fixed. In the case of a connection by means of a ball joint, the best way to establish the three other degrees of freedom is by specifying the relevant angles in the same way that locations are specified on a globe. As a concrete example, but without implying any limitation, the first axis around which the angles are determined can be selected as a kind of connection between the poles, which remains fixed in space.

The second degree of freedom is fixed by determination of the angle around an axis lying in the (original) plane of the equator, and the third degree of freedom can be fixed by

determination of the angle around an axis which passes both through the center of the ball and also through the point whose position has been determined by means of the previously explained steps.

If we now let these various movements proceed individually before our eyes, we see that all three axes around which a spherically supported body can be moved necessarily pass through the center of the ball.

Evaluation of the three-dimensional joint invention with respect to the previously known spherical suspensions leads to the following result:

Because the current formulation of claim 1 in this application is based exclusively on the orientation in space of the axis between the headband of the headphones and each of the two earpieces and because the actual position or arrangement of the axis is not defined in detail, both DE 25 40 839 A and US 5,117,464 A embody a state of the art which presents a certain danger to this application, because, as explained above, it is clear that a spherical joint can also be rotated around an axis which meets the definitions of claim 1 even if no axis is (mechanically) realized.

Three-Dimensional Joint Invention in Light of the Other Publications:

With its axes P2, EP 0 994 636 A has joints similar to the three-dimensional joint invention, but the axes themselves lie in the X plane and in the Y plane, normal to the Z plane, and therefore do not fulfill the definition made by the invention and also do not lead to the effect of the invention.

DE 26 42 786 A discloses nothing which resembles a three-dimensional joint.

On the headband side of the universal suspension, JP 10 [1998]-174, 187 A has a type of three-dimensional axis which is rotated exactly 90° from the three-dimensional axis of EP 0 994 636 A; that is, it is parallel to the Z plane, parallel to the X plane, and normal to the Y plane. As can be seen from a comparison of Figures 1 and 6, the result is obviously completely different here as well.

DE 32 25 812 A finally, discloses headphones for which it might be argued that the two axes around which the earpieces are rotated correspond jointly to a three-dimensional skew axis. This can also be derived from the claims, where it is stated "...support... in an articulated manner in such a way that each bracket can rotate around its longitudinal axis and in the direction opposite the adjusting direction of the headband", which means that no importance at all is being attached to the design of two axes.

In comparison, the arrangement of a single, skew axis offers a considerable simplification while simultaneously improving the mechanical stability.

The present Information Disclosure Statement is being submitted after the issuance of a first Official Action but before the issuance of a Final Action or a Notice of Allowance. The amount of \$180 in payment of the government fee for filing an Information Disclosure Statement after a first Action on the merits but before a final rejection or a Notice of Allowance is being charged as per attached form PTO-2038.

With the submission of this admitted prior art applicant complies with the duty of disclosure as set forth at 37 C.F.R. 1.56.

Any additional fees or charges required at this time in connection with this application may be charged to Patent and Trademark Office Deposit Account No. 11-1835.

Respectfully submitted,

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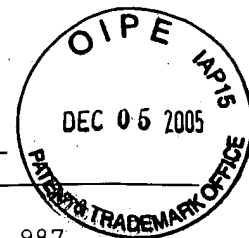
Dated: December 1, 2005

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, PO Box 1450 Alexandria, VA 22313-1450, on December 1, 2005.

By: *F K*
Friedrich Kueffner

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LIST OF PRIOR ART
CITED BY APPLICANT

Applicant: Hugo Lenhard-Backhaus

Filing Date: January 29, 2004 Group: 2643

U.S. PATENT DOCUMENTS

Exam Init.	Document Number	Date	NAME	Class Subclass	Filing Date if appropriate
AA	5 117 464	5/92	JONES ET AL		
AB					
AC					
AD					

FOREIGN PATENT DOCUMENTS

	Document Number	Date	COUNTRY	Class Subclass	TRANSLATION	
					Yes	No
AF	0 994 636	4/00	EUROPEAN			
AG	26 42 786	4/78	GERMANY			X
AH	101 74 187	6/98	JAPAN			X
AK	32 25 812	2/83	GERMANY			X
AL	25 40 839	4/76	GERMANY			X

OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

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